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JULY 1961

agricultural marketing

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Dual Grading for Beef

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service

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July 1961

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Cover page

Today, the consumer wants meat that is closely trimmed and the retailer obliges. So the amount of lean meat a carcass will yield, and the amount of fat that must be trimmed off, take on a new significance. Traditionally, differences in meat quality have been recognized in our marketing systems, but differences in the yield of the most valuable cuts have not—for the very good reason that there previously has not been an efficient and reliable way of identifying these 'yield' differences.

But recent studies by USDA and several agricultural colleges indicate that differences in yield of retail cuts can be recognized in both the carcass and the live animal with workable accuracy. This offers the possibility of 'dual' grading—a system that provides two separate identifications of value—a quality grade and a 'yield' grade.

This idea is not a USDA proposal at the present time. But standardization specialists of AMS have been demonstrating the new idea to the industry in all parts of the country for its evaluation.

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Editor, MILTON HOFFMAN

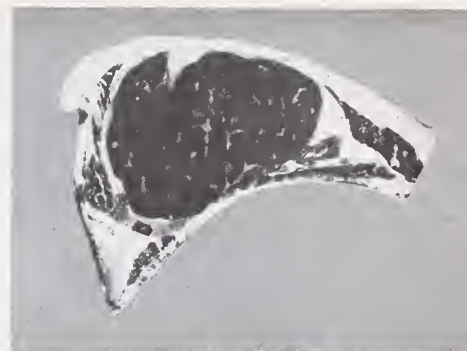
Assistant editor, DANIEL W. HICKY

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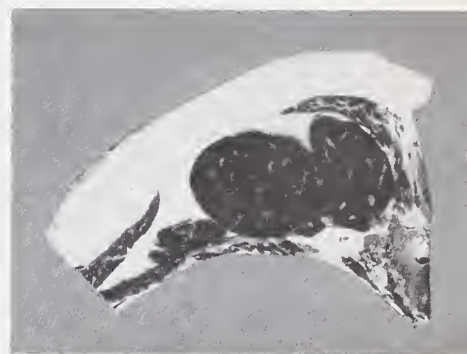




This steer graded the same (U.S. Choice), weighed same (1150 pounds), and brought its owner the same price (\$24 per hundred-weight) as the steer below. But the carcass from this meat-type animal will be worth more to the retailer. It will yield a higher percentage of boneless cuts from rib, round, loin, and chuck. It will yield less fat.



This over-finished steer produces high-quality beef but yields less meat, more fat than meat-type steer above. This animal has a thick fat covering, full flank, wasty brisket, and in comparison with steer above has less firm finish, thinner muscling. Carcass had 9 square inches of rib eye area; carcass from the meat-type, 13 square inches.



USDA livestock standardization specialists are demonstrating this new idea to cattlemen, packers, and others in meat industry.

Dual Grading for BEEF

by ELEANOR FERRIS

IN LOS ANGELES, Knoxville, Denver, Kansas City—and in many other communities in all parts of the country—standardization specialists of the Livestock Division, Agricultural Marketing Service, for the past year have been demonstrating a new idea in beef grading.

The idea: “dual” grading—separate grades for the two main factors that determine the value of a beef carcass: (1) the quality, or palatability, of the lean meat and (2) the yield of trimmed retail cuts from the carcass.

Behind this idea is the fact that carcasses of the same quality grade can differ markedly in their yield of the most valuable retail cuts—those

from the round, loin, rib, and chuck—which account for more than 80 percent of the value of a carcass.

The standardization specialists point out that “differences in meat quality have traditionally been recognized in our marketing system, but differences in the yield of the most valuable cuts have not—for the very good reason that there has not previously been an efficient and reliable way of identifying these ‘yield’ differences.”

“‘Dual’ grading,” they assert, “could supply the necessary yardstick for measuring these differences in yield and in value.”

Before groups of cattlemen, marketing men, packers, and university students and researchers, these standardization specialists, who worked more than five years in developing the “dual” grading con-

cept, are showing how it works.

At a recent demonstration, for example, they picked out two beef carcasses of the same weight and quality grade.

“One of these carcasses,” they told their audience, “is worth \$70 more to the retailer than the other one.” Then they proceeded to prove that statement.

First they pointed out how they could predict the yield of trimmed boneless retail cuts from the round, loin, rib, and chuck.

“After studying more than 1,000 beef carcasses,” they said, “we know we can predict the yield of these cuts quite accurately on the basis of four factors: the thickness of the fat over the rib eye, the size of the rib eye muscle, the amount of kidney and pelvic fat, and the carcass weight.”

Then to show exactly how their

The author is an information specialist in the Marketing Information Division AMS.

prediction of the yield of cuts compared with the actual yield, they had the carcasses cut up, boned, and trimmed of excess fat.

The resulting cuts and the waste fat and bone were weighed and these weights multiplied by their current price per pound. The closely trimmed boneless major cuts accounted for nearly 51 percent of the weight of the high-yielding carcass; for the lower-yielding carcass, these cuts accounted for less than 43 percent of the weight. Waste fat from the high-yielder was about 16½ percent of the carcass weight—while for the low-yielder it was nearly 27 percent. It wasn't hard to see the \$70 difference in value.

This demonstration makes it plain that the amount of waste fat on a carcass has an important effect on the yield and on the value.

Time was when we consumed a lot of this fat along with the lean. But today the consumer wants his meat closely trimmed and the retailer obliges. So now the amount of lean meat a carcass will yield, and the amount of fat that must be trimmed off, take on a new significance.

The U. S. grade standards for beef now in use provide grades based on a composite evaluation of quality and conformation. Although conformation does give some indication of yield of retail cuts the present grades give no direct consideration to the amount of fat over the outside of a carcass—the most important factor affecting this yield.

Judging meat quality

Quality is judged on the basis of marbling, color, texture, and firmness of the lean meat in relation to the maturity of the animal from which it was produced.

Conformation is evaluated by considering such factors as the thickness of muscling and the relative development of the most valuable parts of the carcass, as opposed to those of lesser value.

These two evaluations (of quality and conformation) are then com-

bined into a single grade—such as Prime, Choice, Good, Standard, etc.

However, since quality and conformation are not perfectly correlated in most carcasses, some compromise must be made in combining them into a single grade. And this makes the grades less precise than they could be were this compromise not necessary.

“Dual grading would eliminate this compromise approach to grading by giving separate grades to quality and to yield. Quality would still be judged as it is now on the basis of marbling, color, texture, firmness, and maturity. Conformation would not be considered in determining the quality grade. It would instead—at least insofar as conformation is indicated by the area of rib eye—become one of the four factors used in determining the yield grade:

1. thickness of fat over the rib eye;
2. the size of the rib eye muscle;
3. the amount of kidney and pelvic fat
4. carcass weight.

Use traditional grade names

The idea now being discussed would employ the traditional grade names of Prime, Choice, Good, etc., to denote quality alone, while a numerical system would be used to designate yield grades.

In testing and demonstrating the “dual” grading plan, ten yield grades have been used, with No. 1 representing the highest yield and No. 10 the lowest. Each of these grades represents a 2.3 percent range in yield of the major boneless retail cuts.

Very few carcasses, however, have been found to fall into the four lowest yielding grades, No. 7 to No. 10. And not many carcasses rate the highest grade, No. 1. Therefore, it seems likely that for practical use, the number of yield grades might be reduced to 5 or 6.

Most carcasses of any given quality, (Choice, for example), fall with-

in a range of 3 to 4 yield grades. But within this range there is a significant difference in value.

In the higher quality grades—Prime, Choice, and Good—each one-percent increase in the yield of the major boneless cuts increases the retail sales value of the carcass by \$1.25 per hundredweight (1959-60 prices).

Thus, 600-pound carcasses that differed by only five percent in their yield of these cuts would have a value difference of \$7.50 per hundredweight, or \$45.

The method they are demonstrating for determining carcass yields was developed by the Livestock Division's standardization specialists after years of studying, testing, and trying out various ideas. They have refined it now to the point that meat experts find it easy to use.

Federal meat graders who have tried out this new “yardstick” have been able to apply it accurately. And they have found that grading on this basis can be about as rapid as the present system.

One of the major advantages of the yield grades is that the factors used are concrete and not subject to great differences in interpretation. And though graders would apply them by “eye,” they *could* actually be measured in case of dispute.

Yield grades from live animals

Can the yield grades be estimated in live animals? “Yes” say the standardization specialists, “just as readily as can the present grades which are widely used by cattle buyers and sellers in trading on live cattle.”

They have proved this point, too, in demonstrations. They do it by grading live cattle for yield, then having them slaughtered and determining the carcass yield grades. The specialists' accuracy scores in these demonstrations have been impressive. They point out that cattle buyers should be able to do just as well—or better.

(continued on page 16)

'Si' Smith— New Administrator for Agricultural Marketing Service



S. R. Smith is the new Administrator of the Agricultural Marketing Service.

Widely known throughout the agricultural marketing community, "Si" Smith is a veteran of 27 years service with USDA. For the past 15 years, he has directed the Department's fruit and vegetable marketing activities.

He succeeds O. V. Wells, who retired as AMS Administrator on May 31 to go to Rome as Assistant Director-General of the Food and Agriculture Organization of the United Nations, in charge of its Economics Department.

Secretary of Agriculture Orville L. Freeman, in naming Mr. Smith to head AMS, paid tribute both to the important mission of the Agricultural Marketing Service, and to Mr. Smith's qualifications to lead the organization.

"The marketing functions of modern agriculture are attracting increasing attention," Secretary Freeman noted, "and are requiring ever-increasing services of the type and

scope provided by the Agricultural Marketing Service. It is essential that the Department be responsive to the demands for these services by producers, marketing agencies and consumers.

"The impact of the regulatory activities of AMS requires effective and objective administration. The expansion of the Department's food distribution activities as a means of sharing agriculture's abundance with the Nation's school children and needy persons requires sustained leadership.

"We are happy to have a man of 'Si' Smith's experience and background available in the Department to assume this important job."

Mr. Smith was born in Dolton, South Dakota, and raised on a Montana farm. He was graduated from the University of Montana with a degree in economics, and did graduate work at the University of California.

He joined USDA in 1934, as an agricultural economist in the Agricultural Adjustment Administration.

His first work for the USDA was research on price analysis of fruit and other crops, at the time when marketing agreements and orders were being developed as a practical technique in agricultural marketing. Later, he became assistant chief of AAA's Fruit and Vegetable Division.

As the U.S. moved into World War II, Mr. Smith was chosen to be Deputy Director for Civilian Programs in the War Food Administration. In that post, he exercised responsibility as civilian claimant for food. He also participated in price support programs and price ceiling work in the War Food Administration, as well as school lunch, direct distribution, and other related civilian program activities.

After the war, he was named director of the Fruit and Vegetable Branch in USDA's new Production and Marketing Administration, and continued as director of the Fruit and Vegetable Division when AMS was established in 1953.

In 1956, USDA recognized his

(continued on page 16)

Federal-State inspector examines onions as they arrive at the plant. He advises plant manager on quality and packing problems involved with this shipment.



Carrots circulate continuously on conveyor belt. Workers select carrots of same size and shape and then place them in polyethylene bags.



Growers, prepackagers, wholesalers, shippers, retailers, and consumers gain when fresh fruits and vegetables are

PACKED UNDER CONTINUOUS INSPECTION OF USDA

by E. E. CONKLIN

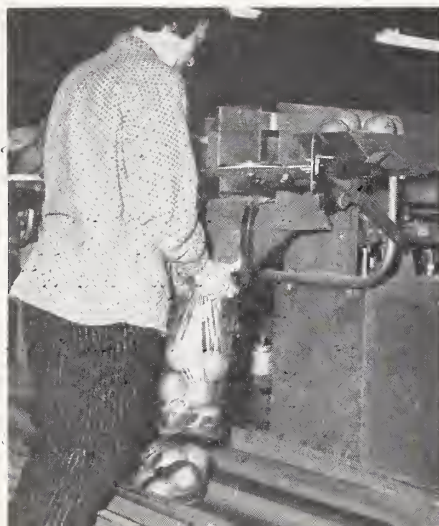
LET'S VISIT the Triple-M Packing Corporation's modern produce prepacking plant at the Philadelphia Food Center. This plant prepackages fruits and vegetables into consumer-size units, under the Continuous Inspection Service of the U.S. Department of Agriculture.

On one side of the huge, high-ceilinged building, three freight cars

sit on an indoor siding. Conveyor belts carry sacks of potatoes and carrots out of their open doors.

The whine of an electric motor comes from the other side of the plant, where a lift truck is picking bin boxes full of oranges from a truck trailer and dumping them at the head of a packing line.

The oranges are regraded, and automatically served up in five-pound batches to rows of women at





Some of the packaged produce turned out by the plant in a single day's operation.

the bagging machines. Polyethylene film bags, bearing a USDA inspection shield and the legend "U.S. No. 1," are filled, tied, and carried off by a conveyor to be packed in master containers.

The next line over is packaging Brussels sprouts in round paper cartons overwrapped with cellophane. And beyond that, a river of bright orange, freshly washed carrots flows continuously past quick-fingered workers who select them by size for filling film bags.

On the third packaging line we can see tomatoes being sorted, sized, and packed into paper tubes.

On the last line, cardboard trays carrying four baking potatoes are overwrapped with film. The trays are fed into a heater that shrinks the film down, holding the potatoes snugly in place.

As the master containers of products pile up at the end of the packing lines, lift trucks hustle them off to trucks waiting at the loading dock.

The sounds of machines and the voices of the workers fill the plant.

Back at the first packing line, the women have switched from bagging oranges to bagging onions with hardly a pause for breath. Before the day is over they may switch several more times—to potatoes, to grapefruit, and back to another

variety of potatoes. This quick-changing versatility is a necessity for a prepackaging plant filling orders from several customers.

The bags of onions, too, carry the shield and the "U.S. No. 1". And on the back of the bag is the printed statement, "Packed under the continuous inspection of the U.S. Department of Agriculture".

The Federal-State Inspection Service keeps a fruit and vegetable inspector in the plant all the while the packing lines are running.

The company pays the cost—and gets the services of an expert on grades and quality who runs a constant quality control check on the entire packing operation.

It's the inspector's job to see that the onions labeled "U.S. No. 1" and the apples labeled "U.S. Extra Fancy" really meet those grade standards.

He starts with a preliminary inspection before the bulk produce is unloaded. He first inspected these onions while they were still sitting in the railcar in fifty-pound sacks.

Triple-M wants top-quality produce. Low quality onions actually cost more than good ones in the long run, because the plant has to throw out part of the onions and must also pay the sorters to do it.

When the onions go through the

packing lines, the inspector is right there too. He shows the sorters how the onions should be graded, and which defects to throw out. He cheek-weighs packages to see if they're within the weight tolerances, and he checks the final packages for grade defects and appearance.

If any of these factors seem to be getting dangerously close to the borderline, he warns the foremen before they actually get out of grade.

Thus, the plant and inspector work together to produce quality prepackaged fruits and vegetables.

Maurice Feldbaum, who guides Triple-M's operations says "Continuous inspection has alerted both our management and our shippers to the protection given the customer buying a package with the government seal."

He points out that preliminary inspections have been one of the unexpected benefits of continuous inspection.

"Before making our purchases, we inform our suppliers that we have full-time government supervision, and cannot pack any produce that doesn't meet the standards set by the USDA in our plant.

"Nearly all our suppliers have cooperated and have upgraded their bulk supplies. This advantage alone has repaid us for the additional expense of the government inspector.

"Their constant supervision has eliminated the human tendency to grade easier when the produce is expensive. The inspector is not concerned with the market; therefore our quality pack withstands the pressure of market conditions.

"They have increased our business. The wholesalers and retailers alike have confidence in us."

The uncompromising standard of quality is there on the bag of onions—"U.S. No. 1", "Packed under the continuous inspection of the U.S. Department of Agriculture".

The author is Chief, Fresh Products Standardization and Inspection Branch, Fruit and Vegetable Division, Agricultural Marketing Service.

Food...is...a

Food



①

...is a

American farmers and marketing men over the years have provided this country with more and better food for less labor. Week in and week out, despite weather or season or distance from the farm, we count on having all the food we want. This is the story of the changes that took place in our food bill between 1947-49 and 1960-- and what happens today to the money we spend in the market for foods produced on American farms. For a more detailed picture of the changes in retail and farm prices, see "Food Costs," Miscellaneous Publication No. 856.



We're getting more for our money, too. More things happen to our food as it travels from farm to supermarket.



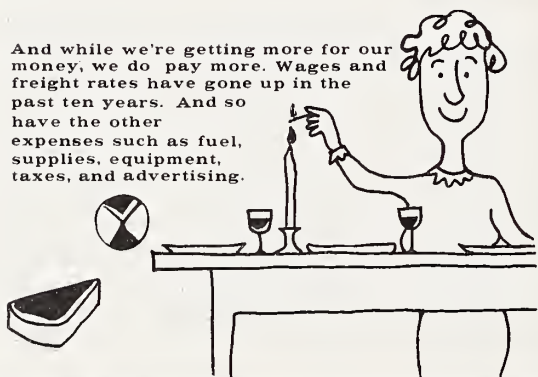
②

For instance, over five million men and women process our vegetables, pack our meat, bake the bread, and do all the other processing and distributing chores. Without them, our orange juice would never leave the orchard, our steak would still be roaming the range.



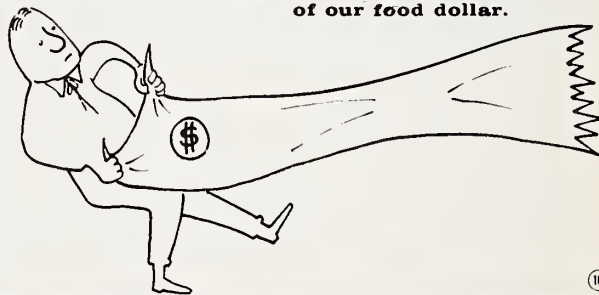
③

And while we're getting more for our money, we do pay more. Wages and freight rates have gone up in the past ten years. And so have the other expenses such as fuel, supplies, equipment, taxes, and advertising.



④

All together, processing, transporting, and distributing food takes 60 cents of our food dollar.



⑤

But at the same time, housing  rose 32 percent... transportation climbed  46 percent...  medical care grew by 57 percent... and the average take-home pay jumped 59 percent! 

⑥

yesterday

So the real cost of food is what we get for our labor. A decade ago an hour's work bought 2.3 pounds of chuck roast...1.8 dozen eggs... 6.5 quarts of milk...9.6 loaves of bread... or 24 pounds of potatoes.



⑦

bargain



3



Just after the war, the family grocery bill was about a fourth of our take-home pay. Today it's less than a fifth even though food prices have gone up.

4

We're getting more transportation service, too. Trains and trucks and planes and barges are making longer trips from the farm to our bigger and bigger cities. Transportation gives us the benefits of year-round production in far away, specialized farm areas.



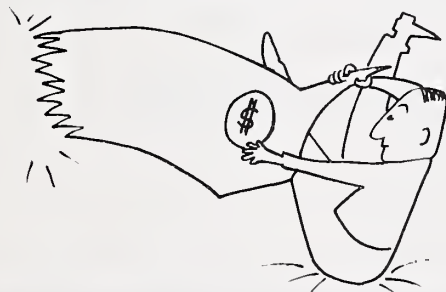
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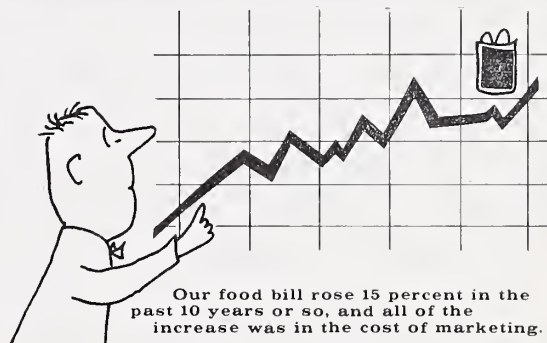
We're getting more convenience with our food money -- more trimmed, packaged, and frozen foods. More built-in-maid-service, such as pre-mixed foods and heat-and-serve dinners.

8

The farmer gets less than 40 cents--that's about 10 cents less than he got a decade ago.



11



Our food bill rose 15 percent in the past 10 years or so, and all of the increase was in the cost of marketing.

12

today

Today, just a little more than 10 years later, our hour of work is worth 3.3 pounds of chuck roast...3.6 dozen eggs...8.1 quarts of milk... 10.1 loaves of bread... or 29 pounds of potatoes. That's why we say . . .

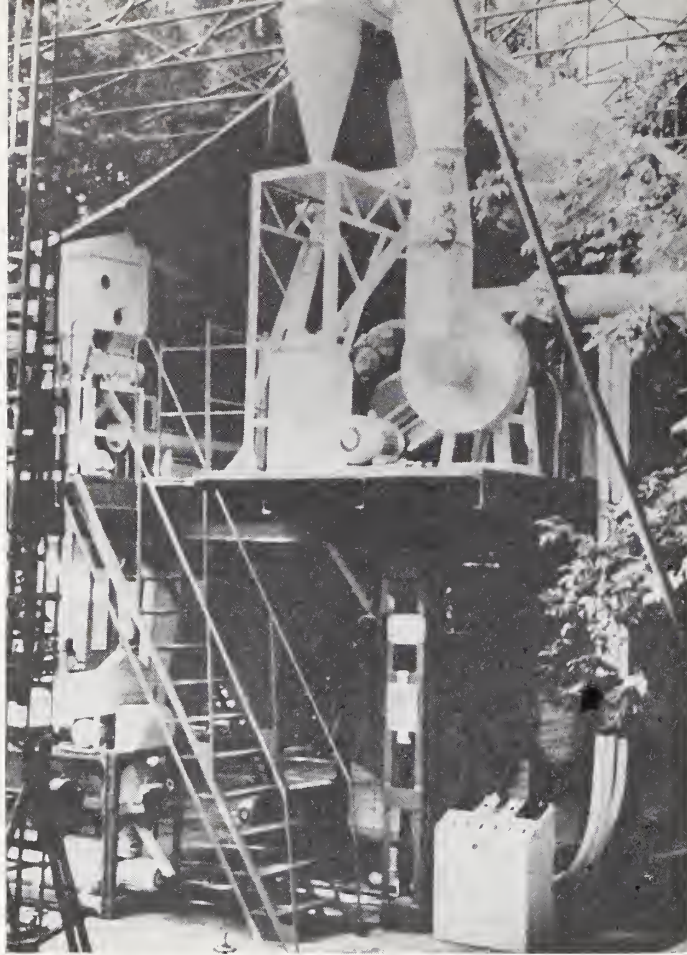


15

FOOD IS A BARGAIN!



16



Above, visitors examine self-propelled combines on State farm in Kustanay. Left, compact flour milling unit now being constructed for State and collective farms.



Woman worker sampling load of wheat with a suction probe on a collective farm.

*All phases of production and marketing are rigidly controlled by the State—
from planting to harvesting, shipping, processing, and selling at the retail level.*

Grain Marketing in the SOVIET UNION

by V. JOHN BRENSIKE

ON JUNE 28, 1960, seven Americans stepped out of a jet plane in Moscow airport to begin a tour of Russian grain marketing facilities. Some 28 days and 8,000 miles later, they were on their way back to the United States with bulging notebooks and a composite view of the grain business, Soviet style.

Here are a few of the observations lifted from their notes.

The team visited 1 State and 2 collective farms, 10 grain elevators, and 7 flour mills as widely separated as

Leningrad in the north and Kustanay in the New Lands area of Kazakstan, comparable to the distance from Boston to Fargo, N.D.

The answers to team members' questions appeared to be thorough. Nevertheless, the size of the country, the scope of the tour, and the limited time available to the team, made their picture of Soviet grain marketing anything but complete.

Grain production plans in the USSR, especially for feed grains, are tied in with the national desire for a 'better' diet. And by 'better,' they usually mean they want to

match, and surpass, our grain output.

The Soviet Union has increased wheat production about 75 percent since World War II. This would make them the world's largest wheat producer. Although they produce more food grains (wheat, rye), their output of feed grains (corn, oats) is less than that of the U.S.

All phases of production and marketing are rigidly controlled by the State, from planting to harvesting, shipping, processing, and selling at the retail level. Most of the wheat that is harvested is used for flour, some for cattle feed, and perhaps 4

or 5 percent is exported.

Production and marketing are run on a giant scale in the Soviet Union, but they have giant problems to match their operations. Long, severe winters, year after year, and droughts sometimes thwart higher production goals. USSR's transportation system in many rural areas is primitive. Their country roads are decades behind ours. They make use of their railroads the way this country did at the turn of the century.

The importance of these problems—and their frequently successful solutions—appears as we follow a load of grain to market.

Agronomists inspect the grain before the wheat leaves the farm. It is tagged for type, weight, and point of origin.

At the local collection point, or elevator, a local inspector supervised by a State inspector checks a sample for moisture content and insect infestation. Here, all the grading factors are analyzed and an official grade is assigned. If the grain is destined for an export elevator, it will be rechecked on arrival by another inspector.

According to Soviet experts, wheat is recleaned at export elevators to not more than 1 percent foreign material and a 2 percent combination of foreign material, rye, barley, and imperfect kernels. If necessary, the wheat is dried to not more than 14-percent moisture content.

Mills placed near the market

If the wheat is destined for a flour mill, it will probably have a long trip to make. Russian mills are placed near the market rather than the grain source. For this reason, all the mills receive about the same quantity of grain each year. The supply sources change as production varies.

The basic flour-milling processes in the Soviet Union are similar to those in other countries. Pneumatic mills handle about 75 percent of all flour. Russians seem to prefer 400-

ton milling units (about 6,500 cwt.) as their maximum for best operation.

Flour is usually shipped in jute bags which hold about 155 pounds. The bags are cleaned and reused about four or five times before being relegated for use as feed sacks. Bulk delivery and storage of flour is just being introduced in Russia.

Flour sent to the State bakeries is used only for bread and rolls. Sweet rolls, cookies, pies, and cakes are baked in State confectionery shops. Nearly all bread baking in the larger cities is done in large, efficiently mechanized bakeries. In contrast, most bread in rural areas is baked in the home.

Protein content rarely determined

The Russians measure the quality of their grain and flour with somewhat different standards than are used in other countries. Testing facilities are well equipped. Protein content of wheat, as such, is rarely determined. An indication of the protein content, however, is obtained by the Klyeikovina test. Although quicker and simpler to carry out than tests used here, it has questionable value as an indication of protein content because of the test's apparent lack of precision. The Russians are using a new test experimentally for gluten quality.

Feed milling lags behind the flour milling industry and far behind its American counterpart. One problem area is a shortage of high-protein ingredients. Sunflower seed and cottonseed are the major sources. Urea is used very little. One feed plant used urea only in the winter.

Again, transportation is a headache. Two of the farms depended upon feedmills located 1,000 miles away. However, the Soviet Union has designed a compact milling unit for on-the-farm mixing.

Feed mills were originally set up as a sideline to flour mills in the consumer areas. Soviet officials reported that there are about 60 large and more than 2,000 small feed mills in Russia today.

Dust collection attachments are common on every item of machinery handling Russian grain. As a result, the officials claim, they have had no dust explosions or fires in any mills.

All of the silos observed were of reinforced concrete. The newer silos are about 20 feet in diameter, 100 feet high, and hold some 25,000 bushels of wheat.

The team was told that some prefabricated concrete elevators were also in use. These prefab units were said to hold about 268,000 bushels.

Almost all of the elevators have stationary, continuous, column-or tower-type driers. Most units can dry up to 24 tons per hour for a moisture reduction of from 4 to 6 percent.

Driers mostly are used in the New Lands area, where the moisture of newly harvested grain may be as high as 30 percent. Often supplemental portable driers are needed.

Diesel oil was the most commonly used fuel for the driers although at least one drier visited used coal. Some areas have plans to convert to gas. Limited research has been done on vacuum and infra-red drying.

The Russian ambition is to increase livestock production which could result in a sharp increase in feed grain output. However, their emphasis on dual-purpose cattle and poultry may pose a problem for them in attempting to increase their livestock and poultry production.

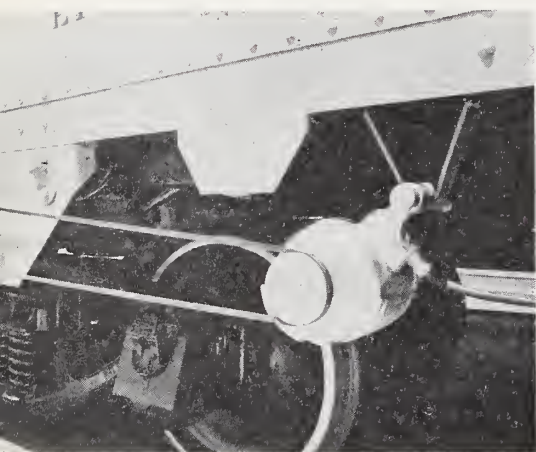
Current Five-Year Plan

They may be able to come close to their 1965 goal for feed quantity. But the nutritional quality of their feed mixes may be more difficult. However, their current Five-Year Plan calls for more feed fortified with antibiotics, vitamins, and minerals among other improvements in the grain marketing system.

The author is a staff member of the Marketing Economics Research Division, Economic Research Service. Other members of the team were John C. Cowan, assistant to the President, Danner Mills, Inc.; Roy C. Durham, technical consultant to the Flour Milling Industry; Dr. Lawrence Zeleny and Leo E. Holman, Agricultural Marketing Service; Raymond E. Vickery and Eugene T. Olson, Foreign Agricultural Service.

RAIL TRANSPORTATION MANUAL

for Fresh Produce Shippers



Operating car fans with auxiliary motors at loading point provide rapid cooling or precooling and reduces temperature spread when the car is held at terminal markets.

FIFTY YEARS of USDA research in the transportation of fresh fruits and vegetables have been condensed into one authoritative volume which gives shippers a rapid run-down of transit requirements for a broad variety of perishable products.

The handbook, entitled "*Protection of Rail Shipments of Fruits and Vegetables*," was written by W. H. Redit and A. A. Hamer, Market Quality Research Division, AMS.

The purpose of the publication is to help shippers select the most desirable rail protective services for their products. It takes into account requirements of the individual product, seasonal needs, geographical location, and cost.

When transit conditions for a particular crop have not been thoroughly studied by USDA researchers, information from outside sources is included in the handbook to give complete coverage of all important fruits and vegetables.

Now in the process of publication, the handbook will be available this summer. *Single copies may be obtained without charge from the Office of Information, U. S. Department of Agriculture, Washington 25, D. C. Ask for AH-195.*

In tackling the problem of proper transit, the authors consider the kind and variety of produce, its condition, how it has been treated at the packing house (waxed, treated with fungicides, or what-have-you), pack-

aging, precooling, loading methods, weather conditions, distance to market, and the type of rail equipment available.

Transit equipment is described in detail. So are the methods of heating and cooling produce shipped in rail cars.

There are many ways to provide proper refrigeration during transit. One of these is with ice, either in bunkers, in containers, or directly on the load.

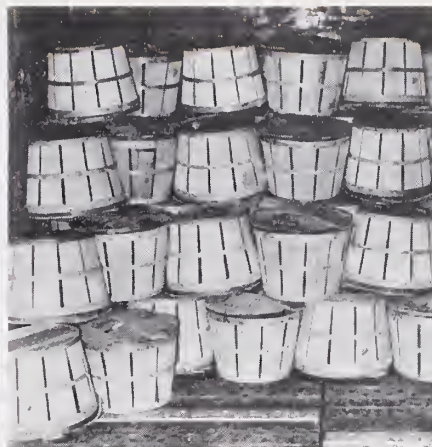
Ice has to be added in sufficient quantities to meet commodity and seasonal needs, and car fans must be used to properly circulate the air.

Mechanical refrigerator cars are equipped to provide either hot or cold air. Heat is provided by electric heating elements or by reverse cycling of refrigeration units. (This is the familiar heat pump.) Heat also may be provided by portable alcohol or charcoal heaters placed in the bunkers, or charcoal heaters installed under the car.

But before any of these facilities of the railroads can be of service to the shipper, he has to have his produce properly packed. In some cases—asparagus, for instance—the container must be specially shaped to suit the commodity. At all times it must have sufficient strength to withstand the weight of other containers in the load. It must be properly designed to minimize bruising and adequately vented to allow cooling.



Icing facilities are provided at strategic loading points and major rail division point. They are so located that cars may be received in transit about once every 24 hours. Many of these stations are equipped with mechanical icers.



Left, an alternately inverted load of $\frac{3}{4}$ -bushel baskets in refrigerator car reduces fruit damage in transit. Damage at right, produced by contact of box with car floor racks, can be prevented by appropriate cushion liners and careful handling.



The use of fiberboard or corrugated cartons has increased tremendously in the past few years. Some commodities are packed in these almost exclusively.

The chief reason for the conversion from wooden to fiberboard containers has been their low cost—in materials and in transportation. Cartons, however, have one major drawback—they can't be hydro-cooled or top-iced. Several manufacturers are now working to develop moisture-resistant corrugated materials which will not weaken when wet by hydrocooling and top-icing.

Once the proper package has been selected, there still remains the proper stacking method. Which suits best? Again, it depends upon the commodity, its loading temperature, and the container. AMS researchers recommend these typical patterns—

- For peaches—alternately inverted baskets
- For watermelons—crosswise placement in the car
- For cartoned citrus—a pattern of vertical zigzagged air channels
- For strawberries—wirebound crates loaded lengthwise with 2- to 4-inch vertical channels between rows.

Temperature control remains a big factor in preserving the quality of fresh fruits and vegetables. The amount of refrigeration necessary to prevent deterioration depends upon the rate of respiration of the indi-

vidual commodity.

Spinach, for example, has a very high respiration rate which, even at 32° F., produces 4,500 B.t.u. per ton per day. At 40° this rate is doubled; at 50° it is 4½ times as great as at 32° F. This means spinach—and most other leafy vegetables—must be moved quickly and maintained at low temperatures from field to retail store.

In addition to these different respiration rates, each fruit and vegetable has its own temperature requirements, and transit refrigeration must be adjusted accordingly.

Temperatures have an effect upon both decay and physiological disorders in fresh produce. In general, rots develop most rapidly at 70° to 85° F. Many of these decays are retarded significantly by only a 10-to-20-degree reduction in commodity temperature. At 32° F. most decay-producing organisms are inactive—although even at this temperature some develop slowly.

Various chemical treatments will also retard decay in transit. These include sulphur dioxide fumigation for grapes, diphenyl liners and wraps for citrus fruits, and various approved sprays and dips.

Another factor affecting the market quality of fresh fruits and vegetables is the amount of moisture in the air surrounding them in transit. A high relative humidity is usually

desirable to prevent wilting. This is true in both iced and mechanically refrigerated cars. Top ice and package ice provide added moisture to preserve freshness and also supply refrigeration.

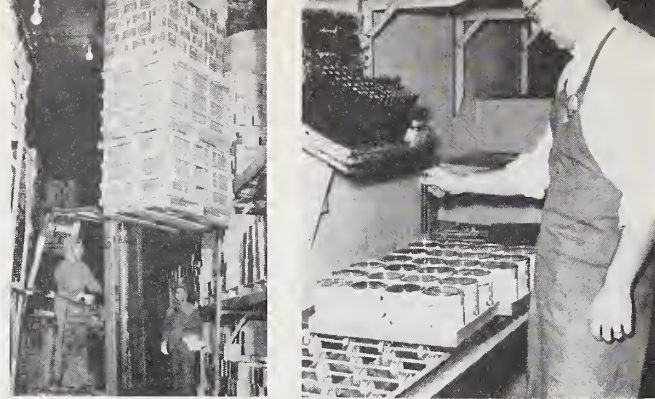
Special care also must be taken in the way the produce is handled. Many decay organisms gain entrance into fruits and vegetables only through breaks in the skin—and these often are caused by rough handling.

Because only one type of protective service may be applied to a carload, only commodities requiring similar transit temperatures should be loaded in a single car. Also, the shipper should remember that this service must be sufficient to protect the more perishable commodity in the load.

While most shippers are aware of these general shipping rules, the handbook alerts them to possible savings through modified refrigeration service, to the probable need for more refrigeration to protect heavier loads, and to the ever-present danger of freezing damage in winter months.

For each of the major fruits and vegetables, the handbook gives a brief discussion of its perishability, temperature and humidity requirements, principal market disorders, special packaging and loading requirements, and other information pertinent to proper handling.

A CLINIC FOR MARKETING SPECIALISTS



provides them with new methods of applying AMS research findings to wholesale and retail food operations.

TWO PRETTY secretaries stood before a meeting of 35 food marketing experts last February—and made chicken salad sandwiches!

The girls had trouble separating the lettuce leaves. They ran out of salad mix. And their sandwich wrappers came undone.

But no one cared. The point was made. They had illustrated the high cost of poor planning.

The demonstration opened the fourth annual retailing and warehousing clinic conducted by Dr. Raymond W. Hoecker of the Agricultural Marketing Service.

At the clinic, State Extension workers, food retailers and warehouse operators, and marketing specialists from State departments of agriculture learn how to reduce food marketing costs through improved handling methods.

Although the sandwich-making demonstration oversimplifies the case—it makes three points quite clear: (1) *Plan ahead.* (2) *Avoid waste motion.* (3) *Coordinate your activities.*

Put into practice in the supermarket or warehouse, these seemingly obvious recommendations can mount to sizable savings.

One supermarket, which followed a simplified work plan, reduced its labor requirements in the produce department. In a year, this amounted to a saving of \$4,300. Extended to the other 600 stores in the chain, it could possibly total over \$2.5 million.

A sizable saving, indeed.

This is but one example. There are many ways to save money through greater efficiency and better facilities. AMS research has discovered and developed a good many of these.

The clinics, conducted by the Wholesaling and Retailing Branch of AMS, help get the results of USDA research into practice—where they will do the most good.

People come from all over the country to attend these clinics—from Hawaii, Puerto Rico, California, and New York.

Typical of those present was Si Trieb, retail marketing specialist of the Kansas Extension Service.

Like most of the other shortcourse “students,” Trieb was no newcomer to the field of marketing. Before joining the Extension Service, he had served for 4 years as executive secretary, Kansas Poultry Assn.

As Extension marketing specialist, he organized and held the first Kansas Food Retailers Conference in October 1958. The meeting served to get the industry interested in an active marketing improvement program. It drew 285 retailers, representing 1,420 Kansas food stores.

Close on the heels of this conference, Trieb and Lew Norwood of the Federal Extension Service in Washington, D. C., began working with a large Lawrence, Kans., supermarket. They conducted a study of the store’s equipment, layout, and hand-

ling techniques, then recommended specific improvements.

This work put AMS findings into practice. Actually, it served to prove them out.

While the store was making the necessary layout changes, Trieb went to Washington to attend his first AMS clinic. He brought with him a complete layout of the Lawrence store and several specific questions.

The clinic was conducted by the Wholesaling and Retailing Branch of AMS. It was one of a series held each winter at the U.S. Department of Agriculture. Hoecker calls it his “primary class.” More formally, it is known as the “Training Clinic in Retail and Warehouse Operations Research.”

This was the clinic at which the girls made the sandwiches. The idea, of course, was to teach the students the value of time and motion studies—when they should be made and how their findings can be put into practice.

There were also sessions on operations charts, micro-motion studies, time-study ratings, standards, and photography.

By the time the two weeks were over, Trieb and everyone else had a good working knowledge of the latest USDA research in improved efficiency. Individual layouts had been studied and analyzed (Trieb got to discuss his Kansas store), and the men knew how to go about conducting a retail and warehouse study.

study.

"The discussions," Trieb said, "provided all of us with new methods of applying AMS research to wholesale and retail food companies."

Back in Kansas, Trieb returned to the Lawrence store. Through close cooperation with the firm's management, AMS, and the Federal Extension Service in Washington, he brought about a complete revamping of the produce department of the supermarket and helped initiate several changes in other departments as well.

In the backroom he eliminated mixed skid loads (to save handling time), enlarged cooler doors and took out thresholds (for easier access), and established a new L-shaped produce station (to ease congestion, improve efficiency).

In the produce department itself, Trieb recommended using larger dollies and widening the aisles between dump tables and refrigerated displays.

He also made changes in the meat, frozen food, dry grocery, and check-out departments.

In less than a year, the Lawrence store reported produce sales per man-hour had risen nearly a third—from \$14.64 to \$23.40.

The job of the Extension worker now becomes one of spreading the word. The Lawrence company is proud of its increased efficiency and is eager to tell its story. So is Si Trieb. If he can get other stores to apply the same techniques, this one store study can achieve many times its original purpose.

The communications job is handled through other Extension workers in the State, through the annual retailers' conference, and by working directly with other food distributors.

Trieb learned how to handle additional problems of a produce department at another of the clinics sponsored by the Wholesaling and Retailing Research Branch.

These are the commodity clinics offered as "intermediate" courses. The one Trieb attended was in Memphis, Tenn., in October of 1959. It lasted three days.

Present were representatives of 10 retail firms—3 or 4 people from each firm (the produce supervisor, the decision-making person from management, and the company's two best produce department managers).

At the conference, Extension people are trained along with the store personnel and work closely with them on getting the programs established in their firms.

The course itself aims at specific problem areas. One session deals with trimming methods and how to design and construct a trim work station. Another focuses on ordering, receiving, and storage; customer service and display. Almost a day is spent working out problems in backroom organization and layout.

Trieb found the course invaluable because "it meets the problems of a produce department head on. You get specific answers to your problems. You find out what to do and how to do it."

With this information, Trieb conducted a produce work methods seminar for one of the progressive Kansas produce wholesalers. This training session was patterned after the Memphis meeting and was well received by the retailers.

By this time, Trieb was ready for the "graduate" course offered to experienced marketing specialists. This he attended in Chevy Chase, Md.

Held annually, this food distribution seminar keeps marketing men informed on the latest research findings. It is geared to the "man in-the-know," who is interested in recent research developments in layout, equipment, work methods, traffic studies; research and educational techniques; and improved merchandising methods.

Through the knowledge of research presented at these specialized training courses, the Kansas State University Extension retail marketing project has rapidly extended the latest findings not only to produce departments, but to meat, dry grocery and other retail store departments as well.

"Next in our plans," says Trieb, "is providing a similar service to Kansas food wholesalers."

Thus it is that the AMS retailing and wholesaling clinics have given Si Trieb and many others the tools to develop strong retail-wholesaling work improvement methods.

* Cooperative Extension workers and State departments of markets personnel from all over the country have participated in these clinics, then gone out to apply what they have learned in their own areas.

Marketing research reports have told them what should be done to improve handling methods and increase efficiency. Hoecker's clinics have explained how to do it, and Lew Norwood's on-the-job demonstrations in the States have developed the competence of the State Extension workers and the rapport with food distribution companies.



The Changing Market

Rail Shipments of Lettuce

AMS researchers find there's less chance of freezing damage to lettuce if initial salting is delayed until the first re-icing station.

Five test shipments of paired ears (one with and one without initial salting) made this amply clear. While temperatures did not reach freezing in any of the cars, lettuce near the bottom bunker of cars with initial salting was in danger of freezing while the cars stood on tracks at shipping or assembly points.

A delay in salting—until the first re-icing station—did not adversely affect the average temperature of the lettuce in transit. And, it did eliminate the possibility of freeze damage.

* * *

Plentiful Foods for July

Topping USDA's Plentiful Foods List during July will be turkeys and peaches.

Cold storage stocks of turkeys are at a record high. July marketings from the 1961 crop are expected to be about 50 percent larger than last year.

Similarly, this year's peach crop is in heavy supply. The harvest in the 9 southern peach States is high, and the California crop looks like it will be the second largest on record.

But these aren't the only farm foods in plentiful supply this month. Summer vegetables from local gardens, and fresh plums from California, also are included on the July Plentiful Foods List.

Dual Grading for Beef

(continued from page 4)

The standardization specialists worked out their method for assessing yield in the live animal in studies involving more than 500 live cattle.

These are the factors they found indicated high yields: thick muscling over the back, bulging rounds, thin, smooth fat covering, trim brisket, and a firm finish.

This is the much sought after "meat-type" steer, the thick-muscled kind which produces a high yield of superior quality meat without depositing a heavy layer of fat over the outside.

USDA specialists feel that the "dual" grading system would encourage production of the meat-type steer. For through such a system, this highly desirable animal can be given recognition—and, being recognized, earn more dollars for owner.

This, specialists contend, would be another step toward more efficient production and marketing of the Nation's leading food product—beef.

* * *

'Si' Smith—New Administrator

(continued from page 5)

"leadership and vision" in conferring on him its top award, the Distinguished Service Award. The official citation read: "For his contributions to the Nation's fruit and vegetable industry by developing, organizing, and administering the Department's marketing service, regulatory, and action programs."

The esteem in which he is held by the agricultural marketing community is indicated by the editorial comment in a national trade publication, as it reported this award: "The USDA honors," it said, "come as little surprise to the fruit and vegetable industry where his advice, judgment, and fairness in administering his job have been found to be significant."

The Agricultural Marketing Service, which Mr. Smith now heads, is responsible for the major marketing service functions of the Department. These include marketing information, inspection and grading, regulatory acts, and marketing research. It also administers the National School Lunch Program and the Special Milk Program, and the distribution of foods to schools, needy persons, and to other eligible recipients. AMS also is responsible for developing and putting into operation the pilot food stamp projects now being conducted in eight selected areas throughout the country.



Growth Through Agricultural Progress